



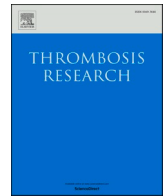
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Letter to the Editors-in-Chief

**SARS-CoV-2 infection, vaccination and acquired hemophilia: Reply***Dear Editor,*

We read with interest the comment by Mungmunpantip and Wiwanitkit [1] on our letter recently published in *Thrombosis Research* [2] and regarding the association between acquired hemophilia A (AHA) and SARS-CoV-2 infection or vaccination. The researchers highlighted the difficulty in establishing a causal role of SARS-CoV-2 in AHA onset in individuals infected by or vaccinated against COVID-19. Such link appears even more difficult to assess unambiguously considering that affected patients are often elderly who have several additional clinical illnesses or predisposing conditions that could have contributed to triggering this rare acquired hemorrhagic disorder [3].

We agree with this comment from the authors, that can also be applied to our case reported in the letter [2]. In addition, the apparently increasing number of SARS-CoV-2-associated AHA reports over the last three years could be only an artifact, mirroring the increasing number of subjects infected or vaccinated against the virus worldwide. With these considerations in mind, from a pathogenic point of view, it cannot however be denied the relationship between infections or vaccinations and AHA onset [3]. The immune system hyperstimulation via inflammation could be the pathway involved [4]. On the other hand, the association of de novo or relapsed autoimmune disorders with SARS-CoV-2 infection is well documented and testifies that this process is not unidirectional but bidirectional involving, as suggested by Mungmunpantip and Wiwanitkit, a close interaction between exogenous (i.e., the virus) and endogenous (i.e., host's genetic profile) factors [5].

Further information from pharmacovigilance data and from experimental studies are necessary to unravel the clinical burden of this issue and the possible mechanisms involved.

**Declaration of competing interest**

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

**References**

- [1] R. Mungmunpantip, V. Wiwanitkit, SARS-CoV-2 infection, vaccination and acquired hemophilia: correspondence, *Thromb. Res.* (2023).
- [2] M. Franchini, D. Focosi, Association between SARS-CoV-2 infection or vaccination and acquired hemophilia A: a case report and literature update, *Thromb. Res.* 222 (2022) 7–11.
- [3] A. Coppola, M. Franchini, A. Tripodi, et al., ad hoc Working Group (Appendix 1). Acquired haemophilia A: Italian Consensus Recommendations on diagnosis, general management and treatment of bleeding, *Blood Transfus.* 20 (2022) 245–262.
- [4] M. Franchini, E. Cappello, G. Valdiserra, et al., Investigating a signal of acquired hemophilia associated with COVID-19 vaccination: a systematic case review, *Semin. Thromb. Hemost.* 49 (2023) 15–26.
- [5] Y. Liu, A.H. Sawalha, Q. Lu, COVID-19 and autoimmune diseases, *Curr. Opin. Rheumatol.* 33 (2021) 155–162.

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